

Appl. No. 10/603,570
Amdt. Dated July 12, 2006
Reply to Office Action of April 12, 2006

Attorney Docket No. 81707.0186
Customer No.: 26021

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A thermoelectric module comprising support substrates, a plurality of wiring conductors formed on the opposing surfaces of the support substrates, a plurality of thermoelectric elements, and solder layers formed between said wiring conductors and said thermoelectric elements, wherein the total projected area (S_v) of voids contained in said solder layers projected onto the surfaces of the support substrates on the side where the solder layers are in contact via the wiring conductors is from 1 to 20% of the total area (S_t) of the surfaces on where the solder layers are in contact with the wiring conductors, wherein said thermoelectric elements are provided with plated layers on the surfaces in contact with the solder layers, wherein said plated layers are formed by plating with nickel and gold.

2-3. (Canceled)

4. (Original) A thermoelectric module according to claim 1, wherein said solder layers have an average thickness of 10 to 50 μm .

5. (Original) A thermoelectric module according to claim 1, wherein the voids contained in said solder layers have an average diameter of 1 to 100 μm .

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6. (Original) A thermoelectric module according to claim 1, wherein said voids have nearly a circular shape when they are projected onto the surfaces of the support substrates on the side in contact via said wiring conductors.

7. (Original) A thermoelectric module according to claim 1, wherein said solder layer comprises an Sn-Sb solder and/or an Au-Sn solder.

8. (Original) A thermoelectric module according to claim 1, wherein said thermoelectric elements contain at two least or more kinds of elements selected from the group consisting of Bi, Sb, Te and Se.

9. (Currently amended) A process for producing a thermoelectric module having at least support substrates, a plurality of wiring conductors formed on the opposing surfaces of the support substrates and a plurality of thermoelectric elements, by applying a solder paste containing a void-forming agent onto the surfaces of either the wiring conductors or the thermoelectric elements in the thermoelectric module, and joining said wiring conductors and said thermoelectric elements together by the a heat treatment, wherein said thermoelectric elements are provided with plated layers on the surfaces in contact with the solder paste, wherein said plated layers are formed by plating with nickel and gold.

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10. (Currently amended) A process for producing a thermoelectric module according to claim 9, wherein the solder paste forms solder layers, wherein the total projected area (S_v) of voids contained in said solder layers projected onto the surfaces of the support substrates on the side where the solder layers are in contact via the wiring conductors is from 1 to 20% of the total area (S_t) of the surfaces on where the solder layers are in contact with the wiring conductors.

11. (Original) A process for producing a thermoelectric module according to claim 9, wherein said paste is prepared by using at least a solder powder and a void-forming agent, the void-forming agent being a resin having a melting point lower than that of the solder powder.

12. (Original) A process for producing a thermoelectric module according to claim 11, wherein said solder powder has a melting point which is not higher than 400°C.